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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Retrieval of temperature profiles from CHAMP for climate monitoring: intercomparison with Envisat MIPAS and GOMOS and different atmospheric analyses" *by* A. Gobiet et al.

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Reviewer 1 comments that a bias in ECMWF temperatures which varies with altitude may affect the MIPAS retrievals if ECMWF is used as a priori. The most prominent bias in ECMWF data under discussion is a cold bias in the order of 2 K between 30 and 45 km (Simmons et al., 2005; Randel et al., 2004). The altitude resolution of MIPAS temperatures as calculated as the half width of the rows of the averaging kernel matrix is 3-4 km, i.e. it is sufficient to resolve the difference between the true temperature profile and the ECMWF temperatures in this case. Wang et al. (2005)

have demonstrated that the ECMWF cold bias in this altitude range does not affect the MIPAS retrievals, since the differences between MIPAS and ECMWF temperatures are similar to the known cold bias of ECMWF. Nevertheless, we admit that our wording "entirely independent" might be somewhat too strong, because any small-scale bias in the a priori not vertically resolved by MIPAS, i.e. less than 3-4 km in vertical extension, can affect the MIPAS retrievals. However, no indication for biased MIPAS temperature profiles due to small-scale biases in the a priori has been found so far. In order to meet these remaining theoretical concerns we will use a less strong wording in the revised version of the paper.

References:

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Wang, D.-Y., et al. (2005), Validation of stratospheric temperatures measured by Michelson Interferometer for Passive Atmospheric Sounding (MIPAS) on Envisat, J. Geophys. Res., 110, D08301, doi:10.1029/2004JD005342.

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